



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

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In Reply Refer To:  
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### MEMORANDUM

To: Field Manager, Bureau of Land Management, Palm Springs South Coast Field Office, Palm Springs, California

From: Field Supervisor, Carlsbad Fish and Wildlife Office  
Carlsbad, California 

Subject: Section 7 Biological Opinion on the Genesis Solar Energy Project, Riverside County, California

This memorandum transmits the U.S. Fish and Wildlife Service's (Service) biological opinion on the construction, operation, and maintenance of the proposed Genesis Solar Energy Project (project or GSEP) located in Riverside County, California, and its effects on the threatened desert tortoise (*Gopherus agassizii*, "tortoise") and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*). Your request for formal consultation dated July 1, 2010, was received on July 6, 2010.

This biological opinion is primarily based on information provided in the following documents and communications: (1) the Bureau of Land Management/California Energy Commission's (BLM/CEC) joint *Staff Assessment and Environmental Impact Statement* (EIS), *Genesis Solar Power Project* (BLM and CEC 2010); (2) the BLM's *Plan Amendment/Final Environmental Impact Statement for the Genesis Solar Power Project* (BLM 2010); (3) the CEC's *Genesis Solar Power Project Revised Staff Assessment* (CEC 2010a); (4) the *Genesis Solar Energy Project Biological Assessment* (Tetra Tech 2010); (5) the CEC's *Genesis Solar Power Project Commission Decision* (CEC 2010b); (6) pre-project desert tortoise survey reports (Tetra Tech and Karl 2009, 2010); (7) final and draft revised desert tortoise recovery plans (Service 1994a, 2008); (8) supplemental materials provided during the consultation process, (9) electronic transmissions from BLM and Genesis Solar (applicant); and (10) pertinent literature contained in our files. The project file for this consultation is located at the Carlsbad Fish and Wildlife Office (CFWO).

### CONSULTATION HISTORY

The Service received a request from the applicant for information on endangered and threatened species in the vicinity of the proposed project on October 4, 2007, and began early consultation



on this project. Between October 2007 and October 2010, the Service, BLM, CEC, California Department of Fish and Game (CDFG), and/or the applicant participated in numerous meetings and conference calls regarding this project, including participating in CEC public workshops and the July 12, 2010, CEC evidentiary hearing. The Service coordinated early with BLM, CEC, and CDFG on the development of measures in the CEC/BLM staff assessment/draft environmental impact statement to avoid, minimize, and offset impacts to the desert tortoise.

In preparing this biological opinion, we provided a draft project description to the BLM and applicant on October 1, 2010, and October 27, 2010, and a draft biological opinion was provided to the BLM on October 28, 2010. All comments received from the BLM and applicant were incorporated into this biological opinion as appropriate.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

The proposed action is the BLM's issuance of a right-of-way (ROW) grant that will authorize construction, operation, maintenance, and decommission of a commercial solar power-generating facility on approximately 809 hectares (ha) [2,000 acres (ac)] of BLM-managed lands. The proposed project in Riverside County, California, is located approximately 40 kilometers (km) [25 miles (mi)] west of the Blythe, 43 km (27 mi) east of Desert Center, and 5 km (3 mi) north of the Interstate 10 (I-10) corridor. Surrounding features include the McCoy Mountains to the east, the Palen Mountains (including the Palen/McCoy Wilderness Area) to the north, and Ford Dry Lake, a dry lakebed, to the south (Figure 1).

#### *Construction*

The project includes construction of a 250-megawatt (MW) nominal commercial solar thermal power-generating facility that will use solar parabolic trough technology to generate electricity. Arrays of parabolic mirrors will collect heat from the sun to warm the heat transfer fluid (HTF) in the solar field piping. Through a series of heat exchangers, heat will be released to generate high-pressure steam that will then be fed to a steam turbine generator to generate electricity. Project components generally include the solar power plant site and associated support facilities, and linear facilities, including an access road and transmission line. See Tetra Tech (2010) for a detailed project description.

Project construction is anticipated to begin in late 2010 on the access road and continue for approximately 37 months. Project construction will require an average of about 646 employees, peaking at approximately 1,085 workers in month 23 of construction. Commercial operation is anticipated to begin in mid-2013.

### Solar Power Plant and Support Facilities

The solar power plant site, or plant site, will consist of two independent 125-MW nominal power units (Figure 2) within a permanently fenced area. Support facilities inside the plant site will include such structures as power blocks, solar arrays, two 2-ha (5-ac ) evaporation ponds, water storage tanks, leach fields, auxiliary systems, administration buildings, parking, and other support facilities. The plant site will be cleared of all vegetation and graded. Laydown and parking areas needed during construction of the solar plant and support facilities will be located within the fenced plant site.

The GSEP will use dry cooling. Water for solar mirror washing, feed water makeup, fire water supply, onsite domestic use, and cooling water for auxiliary equipment heat rejection (auxiliary cooling tower and auxiliary boiler) will be supplied from groundwater wells on the plant site, and stored in several onsite storage tanks. Sanitary wastewater will be collected for treatment in septic tanks and disposed of via leach fields on the plant site.

A permanent security fence will be installed along the perimeter of the plant site and will be a 2.4-meter (m) [8.0-foot (ft)] tall chain-link fence, topped with 0.30 m (1 ft) of barbed wire (three strands) mounted on 45-degree extension arms and posts set in concrete. Controlled access gates will be located at the entrances to the facility to restrict access. Permanent tortoise exclusion fencing will be installed along the outside of the entire security fence and the entrance gates.

Development of the plant site will also include channelizing and rerouting storm flows along the perimeter into three channels, one along each of the west and east boundaries (outside the perimeter fence), and one on the plant site between the two units. Flows will be returned to their sheet flow regime south and southwest of the project footprint. The rerouted channels and associated diversion berms will be designed to contain a 100-year, 24-hour storm event within the channel, be armored as necessary for erosion protection using natural gravel derived during site grading activities, and be maintained periodically or after major storm events as needed to sustain their proper function. The perimeter security fence will completely enclose the two power units, though the fence will not be installed across the inlets and outlets of the central rerouted drainage channel traversing the power plant. Instead, this channel will remain unfenced.

### Access Road and Linear Facilities

The plant site will be accessed via a new road extending approximately 10.5 km (6.5 mi) from Wiley's Well Rest Area at the I-10 interchange to the plant site (Figure 2). The new access road will be paved with approximately 3,000 tons of imported asphalt concrete material. Crossings for all major washes will be Arizona-type crossings.

Linear facilities, including distribution and communication lines, natural gas and water pipelines, and a generation tie transmission line (gen-tie line) will be constructed within a utility corridor extending approximately 10.5 km (6.5 mi) adjacent to the access road from Wiley's Well Rest Area to the plant site (Figure 2). The gen-tie line will be a 230-kilovolt (kV) bundled circuit line

supported by concrete or steel monopole or tower structures. The distribution line will provide temporary power and communication during project construction and will tie into electrical power from an existing Southern California Edison (SCE) distribution line near the Wiley's Well Rest Area. The new distribution line will be installed either above or below ground. If the line is installed above ground, it will be supported by single poles. A primary fiber-optic communication line will be mounted on the gen-tie line poles and a secondary (redundant) fiber-optic communication line will be mounted on the new distribution line poles and buried underground. Auxiliary boilers on the plant site will be fueled by natural gas supplied from a new pipeline connecting to an existing Southern California Gas pipeline located north of I-10. A water pipeline will be co-located with the natural gas pipeline in the utility corridor.

The gen-tie line will extend an additional 2.4 km (1.5 mi) from the Wiley's Well Rest Area, cross Interstate 10 (I-10), and tie into the Blythe Energy Project transmission line (BEPTL). The gen-tie line will use the existing pole structures of the BEPTL to interconnect with SCE's future Colorado River Switchyard (CRS) Substation to the east. However, six new transmission line poles will be constructed from the BEPTL to tie into the CRS as part of the proposed project. To the extent possible, the existing BEPTL maintenance road, laydown areas, and pulling sites will be used to install the six new poles and line. Laydown/staging and parking areas needed for construction of the access road and linear facilities will be located within the power plant site or along the access road.

#### Construction Timing Relative to Desert Tortoise Clearance Surveys

Prior to construction of linear facilities (i.e., access road, distribution and communication lines, natural gas and water pipelines, and gen-tie line), rerouted drainage channels off the plant site, or perimeter security fence, either temporary tortoise exclusion fencing will be installed, or a biological monitor will be present in the immediate vicinity of construction activities.

Clearance surveys for desert tortoise along linear facilities off the plant site, rerouted drainage channels off the plant site, or perimeter security fencing may be conducted during any season. Any tortoise found during clearance surveys of the linear facilities off the plant site will be moved out of harm's way within 500 m (1,640 ft) of the disturbance area in accordance with the Service's *Desert Tortoise Field Manual* (Service 2009a) or more recent Service guidance. However, any tortoises found during clearance surveys along the rerouted drainage channels off the plant site or perimeter security fence will be considered translocatees<sup>1</sup>.

Desert tortoise clearance surveys associated with all components within the fenced plant site will be conducted during the desert tortoise's most active season (April to May, September to October). Surveys outside of these periods require approval by CFWO. Clearance surveys will be conducted in accordance with the Service's *Desert Tortoise Field Manual* (Service 2009a) or

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<sup>1</sup> "Translocatee" refers to tortoises found on the plant site, along the security fence line, or along rerouted drainage channels off the plant site that will be translocated, given health assessments, and moved and monitored in accordance with the final Relocation/Translocation Plan.

the latest Service guidance. Any tortoises found during clearance surveys of the plant site also will be considered translocatees.

#### *Operations and Maintenance*

Operation and maintenance (O&M) will occur during the 30-year life of the project. While electrical power is to be generated only during daylight hours, GSEP will be staffed 24 hours a day, 7 days per week. A total estimated workforce of 40 to 50 fulltime employees will be needed once the GSEP is fully operational.

Within the fenced plant site, routine O&M will include such activities as maintenance and repair of the perimeter security fence, access gates, solar array components, support facilities, and evaporation ponds, mirror washing, vehicle and equipment movement, and vegetation removal. Solar mirrors will be sprayed with treated water once or twice per week, determined by the reflectivity monitoring program. Washing is anticipated to require 2 ac-ft per year, and will generally be done at night and will involve a water truck spraying treated (i.e., demineralized) water on the mirrors in a drive-by fashion. Because the mirrors will be angled down for washing, water will not accumulate on the mirrors; instead, it will fall from the mirrors to the ground. Due to the small volume, the applicant anticipates the water will soak into the soil with no appreciable runoff. Any remaining rinse water from the washing operation is expected to evaporate on the mirror surface.

Outside of the fenced plant site, O&M activities will be conducted along the access road and in the utility corridor, rerouted drainage channels, and along the outer side of the perimeter security fence. Routine O&M activities will include activities such as periodic cleaning of the line conductors and replacement and/or repair of equipment damaged by wind, dust, or accident, road grading and drainage structure repairs to maintain a drivable surface along the access roads, and repair of the perimeter security fence. Such activities are anticipated to occur throughout the year as needed. O&M of the rerouted channels will occur to reduce the hydraulic roughness, improve flood conveyance capacity, and maintain adequate protection of the stream banks from erosion, and will include vegetation management to maintain cover at less than 38 centimeters (cm) [15 inches (in)] in height, periodic debris removal, and erosion repairs. Maintenance will occur predominantly by hand crews and pickup truck; however, it may be necessary to use heavy equipment (e.g., loader, excavator, and wheel dump trucks) to repair structural features and clean out debris following large storm events. The newly constructed access road to the plant site will provide O&M access to the utility corridor. A dirt road created during construction will provide O&M access to rerouted drainage channels and the outer side of the perimeter security fence.

According to information provided by the applicant, routine O&M activities are expected to occur along existing access roads, access roads created for the project, and areas previously disturbed during construction-related activities. Therefore, we do not expect routine O&M activities will result in additional direct habitat disturbance above what will be disturbed during construction activities.

The proposed project will disturb approximately 789 ha (1,950 ac), of which approximately 718 ha (1,774 ac) is desert tortoise habitat, including approximately 10 ha (24 ac) in tortoise critical habitat. This impact acreage includes all permanent and long-term/temporary habitat disturbance associated with construction and O&M of the (1) plant site [approximately 693 ha (1,712 ac)] and perimeter security fence, (2) rerouted drainage channels on and off the plant site, and (3) linear facilities<sup>2</sup>, including the 6-pole extension from the BEPTL to the future CRS Substation. Any non-emergency expansion of construction or O&M activities into areas outside of the areas considered in this biological opinion will require BLM approval and tortoise clearance surveys, and may require reinitiation of consultation with the Service.

### *Decommissioning*

The planned operational life of the proposed project is 30 years, but the facility conceivably could operate for a longer or shorter period depending on economic or other circumstances. However, if the facility were to become economically non-viable before 30 years of operation, permanent closure could occur sooner. In any case, BLM will require a Decommissioning Plan be prepared and put into effect when permanent closure occurs. The procedures provided in the Decommissioning Plan will be developed to ensure compliance with applicable laws and regulations, and to ensure public health and safety and protection of the environment. The Decommissioning Plan will be submitted to the BLM for review and approval prior to a planned closure. When the BLM begins to consider decommissioning, they will contact the Service to determine if additional consultation, pursuant to section 7(a)(2) of the Act, would be appropriate. Consequently, we will not analyze the potential effects of decommissioning on the desert tortoise in this biological opinion.

### *Translocation*

The applicant will develop a final Relocation/Translocation Plan (Plan) that requires approval by the Service prior to the initiation of any ground-disturbing construction activities on the plant site or along the perimeter security fence or rerouted drainage channels off the plant site. The Plan will incorporate the Service's desert tortoise translocation guidance (Service 2010a), as appropriate for the GSEP project, and will include detailed descriptions of how and where tortoises found on the plant site and along the security fence and rerouted drainage channels off the plant site will be translocated, and include such information as: maps identifying the recipient sites, a description of how disease prevalence of resident tortoises at the recipient sites will be documented, and how translocated tortoises will be monitored.

Two sites have been identified to serve as recipient sites for tortoises from the plant site, the security fence line, and rerouted drainage channels off the plant site: the Genesis recipient site (primary site) and the Upper McCoy Wash recipient site (secondary site). The "Environmental

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<sup>2</sup> Linear facilities include the new access road, distribution and communication lines, natural gas and water pipelines, and gen-tie transmission line. Impact acreages associated with the distribution and gen-tie lines include crossing structures, pole pads, crane pads, pulling/splicing sites, and spur roads.

Baseline” section below includes descriptions of the general areas where these recipient sites will be located. The exact locations of these sites will be defined in the final Plan.

Desert tortoises located during clearance surveys will undergo varying levels of health assessments, depending on where they are found on the plant site, security fence line, or rerouted drainage channels off the plant. For tortoises that will be translocated less than 500 m (1,640 ft) to the recipient site, only visual health assessments will be conducted prior to release at the recipient site. For tortoises that will be translocated greater than 500 m (1,640 ft) to the recipient site, visual health assessments and blood draw for enzyme-linked immunosorbent assay (ELISA) testing for *Mycroplasma testudineuim* or *M. agassizii* will be conducted prior to release at the recipient site. Tortoises to be translocated greater than 500 m (1,640 ft) will be monitored on the plant site or remain in quarantine pending the receipt of ELISA test results. All blood samples will be drawn between May 15 and October 31. Blood draw outside of this period requires approval by CFWO.

To determine disease prevalence in the resident population at the recipient sites, the applicant will perform health assessments on all resident desert tortoises within contiguous tortoise habitat 1.5 km (0.9 mi) of the point of release of each translocated tortoise prior to their release. When the recipient site will be receiving tortoises that will be moved less than 500 m (1,640 ft) from the point of collection, health assessments of the resident tortoises will only include a visual assessment for the clinical signs of disease (no disease testing required). When the recipient site will be receiving tortoises that will be moved greater than 500 m (1,640 ft) from the point of collection, health assessments of the resident tortoises will include a visual assessment and disease testing via blood samples for ELISA testing.

Translocated tortoises will not be released within 1.5 km (0.9 mi) of a diseased [documented seropositive or clinically ill (showing signs of disease)] resident tortoise at the recipient site. Therefore, if a diseased tortoise is found within this 1.5 km (0.9 mi) area and the recipient site is not large enough to release translocated tortoises at least 1.5 km (0.9 mi) from diseased resident tortoises, then translocated tortoises will be translocated to the Upper McCoy Wash recipient site. Prior to release of translocated tortoises to the Upper McCoy Wash recipient site, the applicant will perform surveys to determine disease prevalence in the resident population by performing visual health assessments and collecting blood for ELISA testing on all resident tortoises within contiguous tortoise habitat 1.5 km (0.9 mi) of the point of release of each translocated tortoise.

Prior to release at the recipient site, the applicant will attach transmitters to all tortoises that will be translocated from the plant site, security fence line, or rerouted drainage channels off the plant site. The applicant will monitor all transmitted tortoises for 5 years (starting from the date of release) as described in the Service’s translocation guidance (Service 2010a). During monitoring, the applicant will, at a minimum, collect information on survivorship, mortality rates, health status, body condition, movement of individuals, and predation of each translocated tortoise. The applicant will also collect blood for ELISA testing annually from each transmitted tortoise.

*Conservation Measures*

The proposed project includes conservation measures that will be implemented to avoid, minimize, and offset potential adverse effects to the tortoise. These measures were developed in coordination with the BLM, CEC, CDFG, and applicant, and correspond directly to the CEC's conditions of certification BIO-1 thru BIO-14 and BIO-29 described in the CEC's Final Decision on the GSEP (CEC 2010b). Therefore, we are incorporating by reference into this biological opinion, the CEC's conditions of certification BIO-1 thru BIO-14 and BIO-29 as described in the CEC's Final Decision, as the conservation measures that will be implemented by the applicant and BLM to avoid, minimize, and offset the impacts to the tortoise associated with the GSEP project. We have provided additional clarification of the requirements outlined in BIO-8, BIO-9, BIO-10, and BIO-13 below. The project description, including the CEC's conditions of certification BIO-1 thru BIO-14 and BIO-29 and the additional clarifications provided below, provide the basis of the effects analysis provided in this biological opinion. The CEC's Final Decision (CEC 2010b) and BLM's final EIS (BLM 2010) include additional measures to offset proposed project impacts on rare and sensitive species and natural communities, which will be implemented to further reduce impacts to biological resources, including those associated with dust, light, and noise, resulting from the proposed project.

**BIO-8: Impact Avoidance and Minimization Measures** - CEC's condition of certification BIO-8 specifies the measures that will be implemented to manage the project site and related facilities in a manner to avoid or minimize impacts to biological resources, including the desert tortoise. To clarify, these measures will also be implemented during all ground-disturbing construction and O&M activities.

**BIO-9: Desert Tortoise Clearance Surveys and Fencing** - CEC's condition of certification BIO-9 specifies the procedures, including seasonal restrictions, for conducting tortoise clearance surveys and handling and moving tortoise out of the disturbance area during construction activities. BIO-9 also specifies that once the area is cleared of tortoise, temporary tortoise exclusion fencing will be installed along linear features unless a biological monitor is present during construction activities. To clarify, these procedures for conducting tortoise clearance surveys, handling and moving tortoises out of the disturbance area, and ensuring tortoises do not re-enter the disturbance area, will also be implemented in areas not enclosed with tortoise-exclusion fencing during any new ground-disturbing activities associated with O&M of the access road, utility corridor, rerouted drainage channels off the plant site, and perimeter security fence.

**BIO-10: Desert Tortoise Relocation/Translocation Plan** - CEC's condition of certification BIO-10 specifies that the Desert Tortoise Relocation/Translocation Plan will be consistent with Service-approved guidelines, and that the final Plan will include all revisions deemed necessary by BLM, Service, CDFG, and CEC, and be approved by the CEC in consultation with the BLM, Service, and CDFG prior to ground-disturbing construction activities. To clarify, the final Desert Tortoise Relocation/Translocation Plan will incorporate the Service's desert tortoise translocation guidance (Service 2010a) and subsequent guidance from the Service, as appropriate for



the GSEP project. The final Desert Tortoise Relocation/Translocation Plan also requires approval by the Service prior to initiation of any ground-disturbing construction activities on the plant site, perimeter security fence line, or rerouted drainage channels off the plant site.

BIO-12: Desert Tortoise Compensatory Mitigation - CEC's condition of certification BIO-12 specifies that the applicant will provide compensatory mitigation at a 1:1 ratio for impacts to approximately 708 ha (1,750 ac), and at a 5:1 ratio for impacts to approximately 10 ha (24 ac) of critical habitat. According to BIO-12, these lands will be acquired to benefit tortoise habitat linkages and population connectivity within and between tortoise critical habitat units, known populations of tortoises, and/or other preserve lands in the Colorado Desert Recovery Unit. To clarify, to compensate for impacts to approximately 10 ha (24 ac) in the Chuckwalla Critical Habitat Unit, approximately 48 ha (120 ac) will be acquired in the Chuckwalla Critical Habitat Unit.

BIO-13: Raven Management Plan - As stated in the CEC's condition of certification BIO-13, the applicant will submit payment to the project sub-account of the Renewable Energy Action Team (REAT) account held by the National Fish and Wildlife Foundation (NFWF) to support the Service Regional Raven Management Program. The amount will be a one-time payment of \$105 per acre of permanent disturbance. To clarify, the applicant will contribute a one-time fee of \$105 per acre<sup>3</sup> of disturbance to 718 ha (1,774 ac) of desert tortoise habitat that will be impacted by the proposed project. Accordingly, a fee of \$186,270 will be assessed to fund the project's portion of the regional management plan for the 30-year ROW grant by the BLM. Documentation for payment of this fee will be submitted to the Service prior to the initiation of ground-disturbing construction activities.

#### *Action Area*

The implementing regulations to section 7(a)(2) of the Act describe the action area to be all areas affected directly or indirectly by the Federal action and not merely the immediate area affected by the proposed project (50 CFR §402.02). The action area is the area of potential direct or indirect effects of the proposed action and any interrelated or interdependent human activities; the direct and indirect effects of these activities include associated physical, chemical, and/or biological effects of considerable likelihood (Service and NMFS 1998). Indirect effects are those that are caused by the proposed action and are later in time but are still reasonably certain to occur (Service and NMFS 1986). Analyses of the environmental baseline, effects of the action on the species and designated critical habitat, cumulative effects, and the impacts of the incidental taking, are based upon the action area as determined by the Service (Service and NMFS 1998).

The action area for the proposed project consists of the 718 ha (1,774 ac) of desert tortoise habitat that will be impacted in the project footprint/site [includes the plant site, perimeter

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<sup>3</sup> Based on the cost allocation methodology described in *Renewable Energy Development And Common Raven Predation on the Desert Tortoise –Summary* (May 2010) and *Cost Allocation Methodology for Implementation of the Regional Raven Management Plan* (July 9, 2010).

security fence, rerouted drainage channels on and off the plant site, access road, and linear facilities (distribution and communication lines, natural gas and water pipelines, and gen-tie line)]. Along the access road and linear facilities off the plant site, the action area also includes a distance of up to 500 m (1,640 ft) where any tortoises will be moved out of harm's way to avoid injury from construction or O&M-related activities. The action area also includes the applicant's proposed desert tortoise recipient (translocation) sites as will be identified in the Relocation/Translocation Plan, and all contiguous tortoise habitat within 6.5 km (4.0 mi) of the recipient sites. By including habitat within 6.5 km (4.0 mi) of the recipient sites, we are including all areas where tortoises may move following translocation<sup>4</sup>.

Finally, the action area encompasses conservation areas that will be acquired to offset the loss of desert tortoise habitat resulting from construction and O&M of the proposed project. The acquisition, management, and monitoring of these conservation areas are expected to have only beneficial effects to tortoises; however, the locations of these conservation areas are currently unknown. As discussed in the condition of certification BIO-12 of the CEC's Final Decision, lands selected for acquisition will be within the Colorado Desert Recovery Unit (Service 2008) and contribute to desert tortoise habitat linkages and population connectivity within and between desert tortoise critical habitat, known populations of tortoises, and/or other preserve lands. The REAT agencies have agreed that improved connectivity along the I-10 corridor is the priority habitat acquisition objective. Prior to the initiation of ground-disturbing construction activities, either conservation lands will be acquired directly by the applicant or the applicant will provide a security to guarantee an adequate level of funding is available for acquisition and management of conservation lands [see CEC condition of certification BIO-12 and BIO-29 (CEC 2010b)].

## STATUS OF THE SPECIES/CRITICAL HABITAT

The following section summarizes information about the desert tortoise on the legal/listing status, distribution and population trends, current threats, and status of critical habitat as discussed in the Service's biological opinion on the California Desert Conservation Area Plan Amendment for the Coachella Valley (Service 2010b). Please refer to that document as well as the draft revised recovery plan (Service 2008) for additional detailed information about these topics and the species' description, life history, and habitat affinities.

*Legal/Listing Status:* The Mojave population of the desert tortoise was proposed for listing by the Service on October 13, 1989, and listed as a threatened species on April 2, 1990 (Service 1989, 1990). The tortoise is also listed as a threatened species under the California Endangered Species Act. The Service designated about 2.6 million ha (6.5 million ac) of critical habitat for the tortoise in portions of California, Nevada, Arizona, and Utah on February 8, 1994 (Service 1994b). The recovery plan was developed for this species in 1994 (Service 1994a). The draft revision to the recovery plan was developed in 2008 (Service 2008), but the plan has not yet been finalized.

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<sup>4</sup> See "Effects of the Action" section for a discussion on post-translocation dispersal.

*Distribution and Population Trends:* Typical desert tortoise habitat in the Mojave Desert is characterized as creosote bush scrub below 1,676 m (5,500 ft) in which precipitation ranges from 5 cm to 20 cm (2 in to 8 in), where a diversity of perennial plants is relatively high, and production of annual plants is high. The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California.

The best available information indicates the Mojave population of the desert tortoise is declining in abundance in most areas throughout its range. Line distance sampling is now being used as part of a long-term monitoring strategy to detect population trends. This program was put into place in 2001, but detecting population trends is expected to be a gradual process and surveys conducted over short periods of time (e.g., 2001 to 2007) would only reveal catastrophic declines or significant changes. However, these data do provide some information on variability in annual and regional densities between recovery units. In general, over the first 6 years of range-wide monitoring (2001-2005, 2007), tortoises were least abundant in the Northeast Mojave Desert Recovery Unit, the highest reported densities occurred in the Upper Virgin River Recovery Unit, and considerable decreases in density were reported in 2003 in the Eastern Colorado and Western Mojave recovery units (Service 2008). The proposed project occurs in the Eastern Colorado Desert Recovery Unit per the species recovery plan (Service 1994a), which was merged with the Northern Colorado Desert Recovery Unit in the draft revised recovery plan (Service 2008) and referred to simply as the Colorado Desert Recovery Unit.

*Current Threats:* The majority of threats to the tortoise and its habitat are associated with human land uses including urbanization, upper respiratory tract disease and possibly other diseases, predation by common ravens and domestic and feral dogs, unauthorized off-highway vehicles activity, authorized vehicular activity, illegal collecting, mortality on paved roads, vandalism, drought, livestock grazing, feral burros, nonnative plants, changes to natural fire regimes, and environmental contaminants.

*Status of Critical Habitat:* The Service designated about 2.6 million ha (6.5 million ac) of critical habitat for the tortoise in portions of California, Nevada, Arizona, and Utah. The primary constituent elements of desert tortoise critical habitat were identified as sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

Threats to critical habitat include urban development, military operations, and multiple-uses of public lands such as off-highway vehicle (OHV) activities and livestock grazing (Service 1994b). The introduction and spread of invasive nonnative plants, changes to natural fire regimes, and environmental contaminants also threaten critical habitat areas. In addition, threats from long-term climate trends, such as recurrent and prolonged drought, and ecological

processes, such as invasive nonnative plant infestations and consequent wildfire risk, are widespread in some areas. These threats have potentially degraded the primary constituent elements of desert tortoise critical habitat over some areas, which if continued, would threaten the viability of populations in affected areas, including habitat linkages between core populations.

The southern portion of the linear facilities associated with the proposed project would cross through and affect approximately 10 ha (24 ac) of the Chuckwalla Critical Habitat Unit. While most critical habitat areas are relatively unaffected by human uses, the critical habitat area that would be affected by the proposed project has been previously affected by ongoing O&M activities associated with an existing transmission line and the recent construction of a new transmission line.

## ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress.

As discussed in the “Action Area” section above, the action area for this project includes: (1) the project area, defined as the 718 ha (1,774 ac) project footprint/site (includes the plant site, perimeter security fence line, rerouted drainage channels on and off the plant site, access road, and linear facilities), and a distance of up to 500 m (1,640 ft) from linear facilities off the plant site where any tortoises will be moved out of harm’s way, (2) the proposed desert tortoise recipient (translocation) sites, and all contiguous tortoise habitat within 6.5 km (4.0 mi) of the recipient sites, and (3) conservation areas. The environmental baseline of each of these components of the action area is described below.

### *Species Abundance in the Action Area*

#### Project Area

The project area is in the Eastern Colorado Desert Recovery Unit per the species recovery plan (Service 1994a), which was merged with the Northern Colorado Desert Recovery Unit in the draft revised recovery plan (Service 2008) and referred to simply as the Colorado Desert Recovery Unit. The project area lies along the alluvial fan emanating from the Palen Mountains to the north and the McCoy Mountains to the east and is underlain by a broad, valley-axial drainage that extends southward between these mountains and drains to Ford Dry Lake, located about one mile south of the project area. The project area is relatively flat and generally slopes from north to south with elevations of approximately 113 m to 122 m (370 ft to 400 ft) above mean sea level.

The project area is relatively undisturbed, although past uses in the vicinity include military training, grazing and OHV recreation. During World War II, the area was part of the General George S. Patton Desert Training Center, officially the California-Arizona Maneuver Area, a simulated theater of operations heavily used by tanks and other military vehicles. The former BLM Ford OHV area was southwest of the project area, but there is currently little evidence of OHV traffic in the area. Access to the project area is poor and limited to a four-wheel-drive track west of the proposed plant site. The I-10 freeway crosses the southern portion of the project area, where the gen-tie transmission line is proposed south of I-10.

The project area is dominated by creosote bush scrub and stabilized to partially stabilized sand dunes [see Table 2 in Tetra Tech (2010) for acreages of each vegetation type occurring in the action area]. Three invasive plant species, Russian thistle (*Salsola tragus*), Saharan mustard (*Brassica tournefortii*), and Mediterranean grass (*Schismus arabicus*), occur in disturbed areas in the project vicinity. Except for small-localized patches, none of these annual plants are prevalent on the project site. Soils are generally soft sandy-loams and loamy-sands, with scattered to 90 percent cover of fine gravel (Tetra Tech 2010). Several small deposits of loose, aeolian sand naturally intersect the linear facilities route and the southern plant site, including some of the drainages. Finer soils on the southern portion of the project area generally reflect proximity to the Ford Dry Lake bed.

Pre-project surveys of the project footprint were conducted in spring and fall 2009 and in spring 2010 (Tetra Tech and Karl 2009, 2010) following the Service's pre-project survey protocol (Service 1992). At the time of the spring 2009 surveys, the project footprint had not been finalized; therefore, 100 percent of the originally requested 1,878 ha (4,640-ac) ROW was surveyed using contiguous, 30-foot-wide belt transects. Zone of influence (ZOI) surveys, as described in the Service's 1992 protocol, were also conducted at established intervals from the ROW boundary. In addition, to comply with CEC data requirements, two additional transects were surveyed beyond the ZOI surveys. As a result of the additional CEC-requested transects and the ZOI transects, surveys were conducted at established intervals approximately 1.6 km (1 mi) from the ROW boundary.

No live tortoises and 25 bone fragments were found within the project footprint during 2009 and 2010 surveys (see Table 5 in Tetra Tech 2010). In addition, one set of tracks were found 0.8 km (0.5 mi) north of the plant site, and 115 bone fragments were found within 1.6 km (1 mi) of the project area. Three burrows (none active) and two partially intact carcasses, both estimated to be 4 or more years old, were also found approximately 6 km (4 mi) west of the project area during 2009/2010 surveys.

The relatively low amount of tortoise sign found in the project footprint and the surrounding survey area indicate that the current tortoise population level in the project area is very low. However, desert tortoises are likely present to the north, west, and east of the project area, where higher quality creosote bush scrub and well-developed washes are present (Tetra Tech 2010). South of the project area, the fine soils, few vegetated washes and sparse vegetation that characterize the habitat nearer the playa are apparently less suitable for tortoise.

While no live tortoises were found, the pre-project surveys represent single points in time, onsite tortoises may have remained undetected, and tortoises may have moved on to the site from surrounding areas after surveys were conducted, especially from the higher quality habitat north of the project area. As a result, we anticipate that a few tortoises may occur in the project footprint. To estimate the number of tortoises, we applied the method for estimating tortoises described in the 2010 survey protocol (Service 2010c). Since the calculation is based on the observation of live tortoises during pre-project surveys, and none were found, we based our calculation on the assumption that at least one tortoise may have been present in the project footprint during pre-project surveys, as indicated by the presence of tortoise tracks 0.8 km (0.5 mi) north of the plant site. Based on this assumption, our calculation yields an estimate of two subadult or adult tortoises (tortoises with a midline carapace length greater than 160 mm) in the project footprint. This estimate is based on an 80 percent probability that a tortoise is above ground based on the previous winter rainfall and a 63 percent probability of detecting a tortoise if above ground (see Service 2010c). The Service's method for estimating tortoise numbers (Service 2010c) also allows us to calculate a 95 percent confidence interval used to indicate the reliability of the data. However, since no live tortoises were found, we are unable to calculate the 95 percent confidence interval associated with the estimate and therefore, cannot determine the reliability of the estimate.

We also estimated the number of subadult and adult tortoises in the project footprint by applying density estimates for areas outside of Desert Wildlife Management Areas (DWMAs) and critical habitat within the Eastern Colorado Desert Recovery Unit, as determined in our amended biological opinion for the California Desert Conservation Area (CDCA) Plan for the Northern and Eastern Colorado Desert (NECO) Coordinated Management Plan amendment (Service 2007). As discussed in our amended biological opinion, we multiplied the average density of tortoises in the recovery unit by 0.1, resulting in a density estimate of 0.7 tortoises per square km (1.8 tortoises per square mi). We estimated the density of tortoises within the DWMAs and critical habitat in the recovery unit based on an average of the densities for the recovery unit from line-distance sampling conducted between 2001 and 2005 (Service 2006). We considered areas outside of DWMAs and critical habitat to generally support substantially lower densities of tortoises based on numerous factors, including elevation, rainfall, vegetation community composition, and other geographic variables that naturally support fewer animals where habitat conditions are not as favorable as with DWMAs and critical habitat. While a portion of the project footprint [approximately 10 ha (24 ac)] is within the Chuckwalla Critical Habitat Unit, we conclude the 0.7 tortoises (1.8 tortoises per square mi) per square km density estimate is a reasonable approximation for the project footprint and constitutes the best available information. Our conclusion is based on the relatively low habitat quality of the entire project footprint and the fact that no live tortoises and relatively little sign were found in the 1,878 ha (4,640 ac) ROW application area (which includes the project footprint). Applying this density of 0.7 tortoises per square km (1.8 tortoises per square mi) to the project footprint yields an estimate of five subadult and adult tortoises in the project footprint.

Applying these two methods, we anticipate that from two to five subadult and adult tortoises may occur in the project footprint. We acknowledge that the estimate of five tortoises likely is an

overestimate since it is based on our assumptions of tortoise densities outside of DWMA's and critical habitat. However, we determined that applying the estimate of five tortoises in the project footprint would provide a biologically conservative approach based on the best data available to establish a baseline for analysis of the potential impacts of the proposed project.

In addition to subadult and adult tortoises, the project footprint is likely to contain juvenile tortoises. Estimating densities of juvenile tortoises is difficult because they are extremely difficult to detect due to their small size and cryptic nature. However, based on a 4-year study of their population ecology, Turner et al. (1987) determined that juveniles accounted for 31 to 51 percent of the overall population. Using this range and the estimated five subadult and adult tortoises in the project footprint, we estimate that the project footprint may support from two to three juveniles. We recognize that the survey data used for these estimates come from a limited number of studies and that population levels are constantly changing. We also recognize that since our estimate of the number of subadult and adult tortoises in the project footprint is likely an overestimate (as discussed above), this estimate of juveniles in the project footprint is likely an overestimate as well, but provides the best available data available to establish a baseline for analysis.

We also expect the proposed project footprint contains tortoise eggs. Estimating the number of tortoise eggs is also extremely difficult given that the eggs are buried beneath the soil surface. To estimate the number of eggs that could be present, we used the average number of eggs found in a clutch (i.e., 5.8, see Service 1994a). Assuming a 1:1 sex ratio, three of the five tortoises estimated in the project footprint may be reproductive females that together could produce approximately 17 eggs per year. However, it is difficult to estimate the number of females or eggs within the project footprint based on the low number of tortoises found during the pre-project surveys. Given the number of assumptions and extrapolations used to estimate the number of eggs [i.e., that five tortoises may occur on site and that three of those five may be female and equally reproductive as the tortoises in the Turner et al. (1984) study area], we determined that the estimate of 17 eggs on the project site has an unknown but high level of uncertainty, and therefore, does not provide a useful measure for analyzing the effects of the proposed project. Therefore, we cannot calculate a reliable estimate for the number of eggs that may be impacted by the proposed project.

Despite the presence of lower-quality habitat in the project footprint, any portion of the project footprint may be used by tortoise for dispersal from surrounding habitat. Desert tortoises are known to use lower-quality intermountain habitat, such as on eastern parts of the project footprint, as dispersal routes, providing passage between high-quality habitat areas in the surrounding mountains (Averill-Murray and Averill-Murray 2005). Historically, tortoise populations in the Sonoran Desert have exchanged individuals at a rate of one migrant per generation (Averill-Murray and Averill-Murray 2005).

### Desert Tortoise Critical Habitat

The southern portion of the linear facilities associated with the proposed project would cross through and affect approximately 10 ha (24 ac) of the Chuckwalla Critical Habitat Unit. Desert tortoise sign, but no live tortoises, was found during surveys of this area.

### Proposed Recipient (Translocation) Sites

As described in the Service's translocation guidance, recipient sites must be sufficiently large to accommodate and maintain resident (if present) and translocated desert tortoises, as well as be free of disease (Service 2010a). In addition, the Service recommends that at least two recipient sites be identified in case resident tortoises at the primary site are determined to be infectious.

As described above in the "Translocation" section, tortoises from the plant site, the perimeter security fence line, and rerouted drainage channels off the plant site would be translocated to the Genesis (primary site) or the Upper McCoy Wash (secondary site) recipient sites depending on the results of health assessments of resident tortoises at these sites. If a diseased [documented seropositive or clinically ill (showing signs of disease)] tortoise is found within 1.5 km (0.9 mi) of the release point of a translocated tortoise and the recipient site is not sufficiently large to avoid contact between diseased and translocated tortoises, then tortoises will be moved to the Upper McCoy Wash recipient site. The BLM and applicant have identified the general locations of these two recipient sites (described below). The exact locations and boundaries of these sites will be identified in the final Relocation/Translocation Plan that requires approval by the Service (see "Conservation Measures" section above). No designated critical habitat occurs in or near either recipient site.

The Genesis recipient site will be located on BLM-managed lands, part of which will be within the Palen/McCoy Wilderness. No ROW or utility corridors currently exist on this site, and future demand is not anticipated. No BLM-designated routes of travel traverse the recipient site. This area historically has received lower levels of recreational use, and such use is not anticipated to increase substantially in the future. Based on recent habitat modeling, habitat value for desert tortoises in this area is similar, or better, to that of the project area (Nussear et al. 2009) and therefore is expected to fulfill the feeding, breeding, sheltering requirements of translocated tortoises. The western portion of the recipient site is within a proposed solar study area in BLM's Solar Energy Study Area Maps published in June 2009 as part of the public scoping process for the Solar Energy Development Programmatic EIS, which would be prioritized for solar development if this EIS is approved. While an application for development of a solar facility has been submitted for the area adjacent to the GSEP, we are not aware of any recent actions related to a new proposed project. In addition, for the reasons discussed above, the REAT agencies assume future conflicting uses are unlikely to be proposed or approved that would impact desert tortoises at this recipient site.

The Genesis recipient site will be located directly west, north, and east of the plant site boundary. The recipient site includes the locations where tortoise translocated from the plant site, the



perimeter security fence line, and rerouted drainage channels off the plant site would be released (referred to as released points) and the area to which translocated tortoise may disperse after translocation. The boundaries of the recipient site will be delineated by applying the distance that each translocated tortoise is anticipated to disperse from the release point following translocation. For the purposes of the GSEP, we will delineate the boundaries based on a 1.5 km (0.9 mi) dispersal distance (see “Effects of the Action” section for a discussion of post-translocation dispersal). The recipient area also represents the area in which health assessments will be conducted on resident tortoises to ensure that translocated tortoises are not released within 1.5 km (0.9 mi) of a diseased [documented seropositive or clinically ill (showing signs of disease)] resident tortoise. We anticipate that based on a dispersal distance of 1.5 km (0.9 mi) west, north, and east of the boundaries of the plant site, the Genesis recipient site may be up to approximately 1,457 ha (3,600 ac). However, the actual size of the recipient site will depend on the number of desert tortoises translocated, the locations of the release points (e.g., west, north, or east of the plant site), and the presence and location of any diseased resident tortoises. Based on our estimate that up to five subadult and adult may occur on the plant site and require translocation, the size of the recipient site described above [1,457 ha (3,600 ac)] is likely an overestimate but provides the best available data available to establish a baseline for analysis.

The Upper McCoy Wash recipient site will be on BLM-managed lands in the upper McCoy Wash area, and adjacent to designated wilderness protected from future development. The recipient site is approximately 24 km (15 mi) north of the project area through the Palen Wash, and is unobstructed topographically from the project area. The site will be chosen to avoid, to the extent possible, existing ROW or utility corridors or designated routes of travel, or areas where future demand is anticipated. The upper McCoy Wash area historically has received lower levels of recreational use, and such use is not anticipated to increase substantially in the future. Based on recent habitat modeling, habitat value for desert tortoises in this area is similar, or better, to that of the project area (Nussear et al. 2009) and therefore is expected to fulfill the feeding, breeding, sheltering requirements of translocated tortoises. The upper McCoy Wash area is not within a proposed solar study area in BLM’s Solar Energy Study Area Maps published in June 2009 as part of the public scoping process for the Solar Energy Development Programmatic EIS, which would be prioritized for solar development if the EIS is approved. For these reasons, the REAT agencies assume future conflicting uses are unlikely to be proposed or approved that would impact desert tortoises at this recipient site.

As discussed above, the recipient site includes the locations where tortoises translocated from the plant site will be released and the area in which translocated tortoise may disperse after translocation. Similar to the Genesis recipient site, the boundaries of the Upper McCoy Wash recipient site will be delineated by applying a 1.5 km (0.9 mi) dispersal distance from a point of release of each translocated tortoise. The recipient area also represents the area in which health assessments will be conducted to ensure that translocated tortoises are not released within 1.5 km (0.9 mi) of a diseased tortoise. Applying this dispersal distance to a single point of release, the Upper McCoy Wash recipient site is estimated to be approximately 706 ha (1,745 ac). However, the actual size of the recipient site will depend on the number of desert tortoises translocated, the locations of the release points, and the presence and location of any diseased resident tortoises.

To estimate tortoise densities at the recipient sites, we applied the same 0.7 tortoises per square km (1.8 tortoises per square mi) density to estimate tortoise density at the Genesis and Upper McCoy Wash recipient sites as we did to estimate the density of tortoises on the project footprint. While the Genesis recipient site is within the approximately 1.6 km (1 mi) area surveyed during pre-project surveys, these surveys did not cover 100 percent of the recipient site and therefore do not provide sufficient data estimate tortoise density in the recipient site. Applying this density yields an estimate of ten subadult and adult tortoises at the approximately 1,457 ha (3,600 ac) Genesis recipient site and an estimate of five subadult and adult tortoises at the approximately 706 ha (1,745 ac) Upper McCoy Wash recipient site.

### Conservation Lands

Habitat acquisition is proposed to offset impacts to tortoise habitat resulting from the proposed project. As part of the proposed project, conservation lands will be acquired within the Colorado Desert Recovery Unit as described in the species' draft revised recovery plan (Service 2008) [includes the Eastern and Northern Colorado Desert Recovery Units as identified in the species' original recovery plan (Service 1994a)]. While the location of these lands has not yet been determined, the REAT agencies have agreed that privately-owned lands will be acquired to benefit tortoise habitat linkages and population connectivity within and between tortoise critical habitat units, known populations of tortoises, and/or or other preserve lands in the Colorado Desert Recovery Unit (BIO-12), primarily along the I-10 corridor. These conservation lands will be conserved and managed in perpetuity for tortoises. Using available data on landownership and willing sellers, the Service has determined that a sufficient amount of privately owned desert tortoise habitat exists within the Colorado Desert Recovery Unit that will be available for acquisition. The Service is also aware of private lands that have been identified by private organizations as available for potential acquisition to offset impacts to desert tortoise habitat in the Eastern Colorado Desert Recovery Unit.

The abundance of tortoises in conservation areas is unknown since the specific areas have not yet been identified. However, because acquisition will focus on areas connected to lands with tortoise habitat equal to or better quality than the project footprint (BIO-12), we anticipate that these conservation lands will contain suitable habitat that is currently occupied or likely to be occupied in the future.

### *Factors Affecting the Species Environment within the Action Area*

#### Project Area

Due to the lack of development, tortoises in the majority of the project area (particularly the plant site north of I-10) are not now impacted by extensive habitat loss or degradation. However, the tortoises are impacted to some extent by several unmaintained roads, invasive nonnative plants, and potentially by predation from common ravens foraging, nesting, and roosting along existing transmission lines south of the action area (south of I-10) and from common ravens nesting elsewhere in the vicinity.

The southern portion of the project area includes the gen-tie transmission line that crosses I-10 and then runs along an existing utility corridor that contains several proposed, existing, or authorized transmission lines. Existing transmission lines include the Devers to Palo Verde No. 1 and Blythe Energy lines. The Service issued biological opinions exempting take of several species, including the tortoise, associated with the Blythe Energy line in 2005, and the Desert Southwest line in 2006, and is currently in formal consultation on the potential impacts of the proposed DPV2 line on tortoises. The Blythe Energy line was recently completed but construction on the Desert Southwest line has not yet been initiated.

The Service issued a programmatic biological opinion evaluating the effects of BLM's CDCA plan amendment for the NECO on tortoises in 2002 and as amended in 2005 and 2007. The programmatic biological opinion exempted take for causal uses (recreation, mining, and vehicle use), livestock grazing, and removal of burros that BLM authorizes through approval of the CDCA Plan. Projects outside of these activity categories require separate consultation.

Actions covered under these previously issued biological opinions have allowed for additional habitat degradation in the project area, primarily along the proposed gen-tie line, likely contributing to additional habitat degradation due to factors such as introduction and spread of invasive plant species and predators associated with disturbed habitats. However, while issuance of biological opinions for the Blythe and Desert Southwest transmission line projects allowed for additional take of desert tortoises and additional degradation of habitat in the project area, these biological opinions also included avoidance, minimization, and offsetting measures that largely maintained the environmental baseline of the species.

#### Proposed Recipient (Translocation) Sites

The general areas of both recipient sites are undeveloped and, therefore, not affected by extensive habitat loss or degradation. However, the Genesis and Upper McCoy Wash recipient sites may be impacted to some extent by invasive nonnative plants, predation from common ravens foraging, nesting, and roosting along existing transmission lines south of the action area (south of I-10) and from common ravens nesting elsewhere in the project vicinity.

The Service issued a biological opinion for the Blythe Solar Power Project (BSPP) in 2010 (Service 2010d), which identified the Upper McCoy Wash area as a secondary recipient site for tortoises from the BSPP. However, while issuance of a biological opinion for the BSPP allowed for additional take of resident desert tortoises at the Upper McCoy Wash recipient site in the form of capture or collection for the purposes of disease testing and monitoring, the biological opinion also included numerous avoidance, minimization, and offsetting measures to enhance the survivability of any tortoises translocated to the site.

#### Conservation Areas

While the location of these lands has not yet been determined, privately owned lands will be acquired to benefit tortoise habitat linkages and population connectivity within and between

tortoise critical habitat units, known populations of tortoises, and/or other preserve lands in the Colorado Desert Recovery Unit in the BLM's NECO bioregional planning unit (BIO-12). These conservation lands will be conserved and managed in perpetuity for tortoises.

## EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat that would be added to the environmental baseline, along with the effects of other activities that are interrelated or interdependent with that action. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur. In contrast to direct effects, indirect effects can often be more subtle, and may affect species and habitat quality over an extended period of time, long after project activities have been completed. Indirect effects are of particular concern for long-lived species such as the tortoise, because project-related effects may not become evident in individuals or populations until years later.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

### *Methodology*

#### Permanent versus Temporary Impacts

Since full recovery of vegetation in the desert can take decades or longer, we consider all ground-disturbing impacts associated with the GSEP project to be permanent. Vasek et al. (1975) found that in the Mojave Desert transmission line construction and O&M activities result in a permanently revegetated maintenance road, enhanced vegetation along the road edge and between tower sites, and reduced vegetation cover under the towers, which recovered significantly but not completely in about 33 years. Based on a quantitative review of studies evaluating post-disturbance plant recovery and success in the Mojave and Sonoran Deserts, Abella (2010) found that reestablishment of perennial shrub cover (to amounts found on undisturbed areas) generally occurs within 100 years but fewer than 40 years in some situations. He also found that vegetation recovery times are likely impacted by a number of variables, including but not limited to climate, invasion by nonnative plants, and level of ongoing disturbance. Based on these factors, we consider temporary impacts to be equivalent to permanent impacts for the purposes of our effects analysis relative to the 30-year life of the project.

Approximately 718 ha (1,774 ac) of tortoise habitat would be directly impacted by construction and O&M activities associated with the proposed project. As discussed in the “Description of the Proposed Action” section above, we do not anticipate additional impacts to habitat during O&M activities outside of what would be impacted during construction. The conservation measures included as part of the project description would help avoid, minimize, and offset impacts to tortoises resulting from construction and O&M activities.

As discussed in the “Environmental Baseline” section above, we estimate that up to five subadult and adult tortoises, up to three juveniles, and a relatively small but unquantifiable number of eggs may occur in the project footprint. We also estimate that up to 10 subadult and adult tortoises may occur in the recipient site. All of these individuals could be directly and indirectly impacted by the proposed project.

### *Direct Effects*

#### Death and Injury

##### Construction and O&M

Death or injury of tortoises could result from collisions with or crushing by vehicles or heavy equipment, including crushing of individuals that take shelter under parked vehicles and are killed or injured when the vehicle is moved. Desert tortoises could also be injured or killed after being trapped in pipes or construction excavations. Other direct effects could include individual tortoises or their eggs being crushed or buried in burrows during construction and O&M-related activities. Because of increased human presence in the area, tortoise may be injured or killed due to collection or vandalism associated with increased encounters with workers’ or visitors’ pets. Desert tortoises may also be attracted to the construction area by application of water to control dust, placing them at higher risk of death or injury.

To minimize the death and injury of tortoises residing in or entering the construction or O&M disturbance areas (e.g., plant site, linear facilities, rerouted channels), the applicant would implement the general and species-specific conservation measures proposed as part of the project. Accordingly, take of tortoises would be minimized by the presence of a Designated Biologist during ground-disturbing construction and O&M activities in the project footprint (BIO-2 and BIO-11). As specified in the CEC’s condition of certification BIO-1, the Designated Biologist must meet the Service’s Authorized Biologist qualifications and be approved by the Service prior to the initiation of ground-disturbing construction activities. Death or injury of tortoises during construction would also be minimized by demarcation of all sensitive biological resource areas by the Designated Biologist (BIO-2). Death or injury of tortoises would be further minimized during construction and O&M activities by demarcation of all work area boundaries prior to ground-disturbing activities, limiting vehicular and equipment traffic to existing routes of travel, and designing and installing all project components off the plant site (e.g., access roads, storage and parking areas, pulling sites, and rerouted channels) to minimize impacts to native plant communities and sensitive biological resources (BIO-8).

Construction activities on the 693-ha (1,712-ac) plant site would be conducted during the more active period of the species as described in the project description and as would be described in the Relocation/Translocation Plan, thereby maximizing the potential to locate and move tortoises out of the disturbance area during construction. Death or injury of tortoises due to construction would be minimized by the requirement for the Designated Biologist to conduct preconstruction clearance surveys of the project area prior to construction and either relocate individuals out of harm's way or translocate individuals to the recipient site as would be outlined in the Service-approved Relocation/Translocation Plan, following Service-approved methods (BIO-9 and BIO-10).

Construction and O&M disturbance areas cleared of tortoises would be either enclosed with tortoise exclusion fencing or monitored by the Designated Biologist or Biological Monitors trained by the Designated Biologist to prevent individuals from re-entering the disturbance area (BIO-3, BIO-8, and BIO-9). Installation of the tortoise exclusion fencing around the plant site would preclude tortoises from re-entering or leaving if not found and removed during clearance surveys. During construction and O&M, breaches in the exclusionary fencing may allow tortoises to pass through the barrier and be affected by project-related activities. However, these potential effects would be minimized by the requirement to conduct at least two clearance surveys of the project footprint prior to construction, and to regularly inspect all permanent and temporary tortoise exclusion fencing, and repair damage to all temporary and permanent fencing immediately (BIO-9).

Any tortoises overlooked by the initial clearance surveys may be detected during construction activities by routine site inspections by the Designated Biologist (BIO-2) or incidental observations by construction workers. The Worker Environmental Awareness Program would be administered to all onsite personnel and be repeated annually for all permanent personnel and within 1 week of arrival to any new construction personnel (BIO-6). This training would enhance the effectiveness of onsite personnel detecting tortoises during construction and O&M activities, and either avoiding them or ensuring they are properly relocated.

The posting and enforcement of specified speed limits and inspections underneath parked vehicles (BIO-8) would further reduce the risk to any tortoises that inadvertently venture onto the roadway during construction or O&M activities. To reduce the likelihood of tortoises in construction areas being trapped in pipes, trenches, or other excavations and being injured or killed, all pipes greater than 8 cm (3 in) stored close to the ground and all excavations would be covered, fenced, or backfilled, and inspected by the Designated Biologist (BIO-2 and BIO-8). To reduce the likelihood of tortoises being attracted to construction areas by application of water to control dust, the minimal amount of water needed would be applied to dirt roads and construction areas, and a Biological Monitor would patrol those areas to ensure water does not puddle (BIO-8).

Overall, we expect that death and injury of most subadult and adult tortoises would be avoided during construction and O&M activities through compliance with the conservation measures. However, since tortoise eggs and juveniles are difficult to detect, we anticipate that an unknown

number of eggs and two to three juveniles occurring in the project footprint would be killed or injured due to construction and O&M activities. We do not expect loss of eggs or juveniles in the project footprint would affect the species local population level because early life stages naturally suffer higher mortality rates and are not as important to the long-term conservation of the species as are breeding adults.

#### Capture, Handling, and Relocation/Translocation

In addition to construction and O&M-related activities, accidental death and injury could result from capturing, handling, and moving tortoises for the purposes of relocating or translocating them out of the project footprint. Accidental death and injury could result from (1) stress or disease transmission associated with handling tortoises, (2) stress associated with moving individuals outside of their established home range, (3) stress associated with artificially increasing the density of tortoises in an area and thereby increasing competition for resources, and (4) disease transmission between translocated and resident tortoises. Capture and handling of translocated and resident tortoises for the purposes of assessing health and monitoring could also result in accidental death or injury from handling to conduct visual health assessments, draw blood for ELISA testing, and secure transmitters.

We anticipate that the applicant would capture and relocate or translocate most subadult and adult desert tortoises from harm's way in the project footprint. Because of the difficulty in detecting juvenile desert tortoises or eggs, the applicant may find and move some but not all juvenile desert tortoises or eggs from the project footprint. Depending on where on the plant, perimeter security fence line, or rerouted drainage channels off the plant site tortoises are found, some individuals would be moved relatively short distances [i.e., less than 500 m (1,640 ft)] but likely still within their home range, and others would be moved farther [i.e., more than 500 m (1,640 ft)], outside of their existing home range.

Capturing, handling, and moving tortoises for the purposes of relocating or translocating them out of the project footprint may result in accidental death or injury if these methods are performed improperly, such as during extreme temperatures, or if tortoises void their bladders and are not rehydrated. Averill-Murray (2001) determined tortoises that voided their bladders during handling had lower overall survival rates (0.81-0.88) than those that did not void (0.96). If multiple tortoises are handled by biologists without the use of appropriate protective measures and procedures, such as reused latex gloves, pathogens may be spread among individuals. Walde et al. (2008) found that the differences in reproduction among translocated, resident, and control desert tortoises were "not likely to be statistically significant" in a study of tortoises at Fort Irwin.

Translocated tortoises may suffer a higher potential for mortality following release when they are moved into unfamiliar territory, and are less likely to have established cover sites for protection prior to home range establishment. Studies have documented various sources of mortality for translocated individuals, including predation, exposure, fire, disease, and flooding (Nussear 2004; Field et al. 2007; Berry 1986; U.S. Army 2009, 2010). The degree to which tortoises

move after translocation depends on whether they are released into typical or atypical habitat; that is, if the recipient area supports habitat similar to that of the source area, tortoises are likely to move less (Nussear 2004). In one study, the majority of dispersal movement away from the release site occurred during the first 2 weeks after translocation (Field et al. 2007). However, Field et al. (2007) and Nussear (2004) showed translocated tortoises appear to reduce movement distances following their first post-translocation hibernation to a level that is not significantly different from resident populations.

Following release, we cannot predict the movement patterns that all translocated animals are likely to exhibit. Previous translocation studies have shown that tortoises released in spring, move variable straight-line distances from their release points during the first year. While the mean straight-line distances reported for several studies are close to or less than 2.5 km (1.6 mi), some individuals move much farther (Nussear 2004, Field et al. 2007, Berry et al. 2009, Drake et al. 2009, Boarman et al. 2010). An individual at Fort Irwin was reported to move 23.0 km (14.3 mi) (Boarman et al. 2010). Based on our analysis of available data, we expect the movements of most tortoises translocated more than 500 m (1,640 ft) to fall within 6.5 km (4.0 mi) of their release points. This distance was estimated by examining the upper limits on the 95 percent confidence intervals for available data. Translocated populations can also significantly expand the area they occupy in the first year following translocation [e.g., 10.1 to 17.9 square km (3.9 to 6.9 square mi) at a Nevada site; from 0.5 to 26.7 square km (0.2 to 10.3 square mi) at a Utah site].

Tortoises translocated shorter distances [i.e., less than 500 m (1,640 ft)] are not likely to move as far following release as tortoises moved longer distances. Walde et al. (2008) found that maximum straight-line dispersal distance for male tortoises was approximately 1.5 km (0.9 mi) in the first year following translocation. The degree to which these animals expand the area they use depends on whether the translocated animals are released into typical or atypical habitat; that is, if the translocation area supports habitat that is similar to that of the source area, desert tortoises are likely to move less (Nussear 2004).

In a study conducted in Ivanpah Valley, 21.4 percent of 28 translocated tortoises died (Field et al. 2007). Nussear (2004) documented mortality rates of 0, 15, and 21 percent in other areas, though this study found that mortality rates among translocated desert tortoises was not statistically different from that observed in resident populations. Because Nussear (2004) did not compare mortality rates in resident populations to those in control groups, we cannot determine if the translocation caused increased mortality rates in the resident population. Recent work on translocation associated with the expansion of Fort Irwin (U.S. Army 2009 and 2010) compared the mortality rates associated with resident and translocated populations with that of the control populations and indicated translocation did not increase mortality above natural levels (Esque et al. 2010). This and other fieldwork indicate that tortoise mortality is most likely to occur in the first year after release. After the first year, translocated individuals are likely to settle into new home ranges and mortality is likely to decrease.



Desert tortoises from the GSEP site would be moved into areas already supporting resident tortoises, which may result in increased competition for forage, especially during drought years. Increased tortoise densities may lead to increased inter-specific encounters and thereby increase the potential for spread of disease, potentially reducing the health of the overall population. Increased tortoise densities also may lead to increased competition for shelter sites and other limited resources or increased incidence of aggressive interactions between individuals (Saethre et al. 2003). Therefore, recipient sites must be sufficiently large to accommodate and maintain the resident and translocated desert tortoises (Service 2010a). Based on our estimate of the resident population in the recipient sites as discussed in the “Environmental Baseline” section, we calculated the maximum allowable final density<sup>5</sup> at the recipient sites. Based on this calculation, the tortoise population (resident plus translocatees) at the Genesis and Upper McCoy Wash recipient sites should not exceed 95<sup>6</sup> and 46<sup>7</sup> tortoises, respectively, after translocation. Since we estimate that current population at the Genesis and Upper McCoy Wash recipient sites is 10 and 5 tortoises, respectively, we do not anticipate that translocation of up to five subadult and adult tortoise (from the plant site perimeter security fence line or rerouted drainage channels off the plant site) to either recipient site would impact the currently estimated population at either recipient site. However, if the density of resident tortoises at the recipient sites is determined to be higher, then the size of the recipient sites may need to be expanded to ensure tortoise density following translocation does not exceed the maximum allowable density.

Translocation has the potential to increase the prevalence of diseases, such as upper respiratory tract disease, in a resident population. Physiological stresses associated with handling and movement or from density-dependent effects could exacerbate this threat if translocated individuals with subclinical upper respiratory tract disease or other diseases begin to exhibit clinical signs of disease due to the stresses associated with handling and movement. This potential conversion of translocated desert tortoises from a non-contagious to contagious state may increase the potential for infection in the resident population above pre-translocation levels.

Following the Service’s translocation guidance (Service 2010a), health assessments would be conducted on all tortoises to be translocated prior to being released. For tortoises that would be translocated less than 500 m (1,640 ft), visual health assessments (without blood draw for ELISA testing) would be conducted. For tortoises that would be moved greater than 500 m (1,640 ft) to the recipient site, visual health assessments and blood draw for ELISA testing would be conducted.

In addition, to minimize the risk associated with potential contact between healthy translocated tortoises and diseased [documented seropositive or clinically ill (showing signs of disease)]

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<sup>5</sup> Defined as 130 percent of the mean density detected in the respective recovery unit (Service 2010b). Mean density in the Eastern Colorado Recovery Unit is estimated to be 5 desert tortoises per square km (13 desert tortoises per square mi) based on line-distance sampling (Service 2009b).

<sup>6</sup> Calculated as 14.6 square km Genesis recipient site multiplied by 6.5 desert tortoises per square km [130 percent multiplied by the mean density of the recovery unit (5 desert tortoises per square km)].

<sup>7</sup> Calculated as 7 square km Upper McCoy Wash recipient site multiplied by 6.5 desert tortoises per square km [130 percent multiplied by the mean density of the recovery unit (5 desert tortoises per square km)].

resident tortoises, the translocation guidance recommends that health assessments be performed on resident tortoises within the translocated tortoises' dispersal area to determine disease prevalence within the population. As discussed above, the extent to which tortoises disperse following translocation appears to be influenced by the distance they are moved from their home range and the availability of resources in the area to which they are moved. Tortoises translocated relatively short distances [up to 500 m (1,640 ft)] have been found to disperse up to 1.5 km (0.9 mi) and we expect the movements of most tortoises translocated more than 500 m (1,640 ft) to fall within 6.5 km (4.0 mi) of their release points. Therefore, for recipient sites that would be receiving tortoises translocated less than 500 m (1,640 ft), Service guidance mandates that visual health assessments (without blood draw for ELISA testing) be conducted on resident tortoises within 1.5 km (0.9 mi) from translocation release points. For recipient sites that would be receiving tortoises translocated over 500 m (1,640 ft), the guidance mandates that visual health assessments with blood draw for ELISA testing be conducted on resident tortoises within 6.5 km (4.0 mi) from translocation release points.

However, for the purposes of the proposed project, we have determined that for recipient sites that would be receiving tortoises translocated over 500 m (1,640 ft), visual health assessments and blood draw for ELISA testing is only necessary for resident tortoises within 1.5 km (0.9 mi) of translocation release points. Our determination is based on the assumption that tortoises translocated greater than 500 m (1,640 ft) are likely to remain closer to their release point in either recipient site due to the presence of better quality habitat than that on the project site. Therefore, tortoises are likely to remain in contact with resident tortoises on the recipient site that previously underwent health assessments as part of the translocation process. As discussed in the "Environmental Baseline" section, the recipient sites will be located within areas of similar or better quality, habitat to that of the project area. Availability of water, forage, and cover sites is anticipated to be higher in the recipient sites due to their proximity to higher value alluvial fans. However, if post-translocation monitoring reveals that tortoises translocated over 500 m (1,640 ft) to either recipient site become diseased, additional resident tortoises within the 6.5 km (4.0 mi) dispersal area would be tested to determine disease prevalence before additional tortoises would be translocated to that recipient site.

We cannot precisely predict how many tortoises would require blood draw since the final number depends on the total number of tortoises translocated and the number of tortoises translocated greater than 500 m (1,640 ft). However, we anticipate a maximum of 20 tortoises may require blood draw (up to five translocated tortoises from the from the plant site, security fence line, or rerouted drainage channels off the plant site, up to ten resident tortoises from the Genesis recipient site, and up to five resident tortoises from the Upper McCoy Wash recipient site).

We cannot reasonably predict the increase in disease prevalence within the resident population that may occur due to translocation. However, the following mitigating circumstances are likely to reduce the magnitude of this threat: (1) the applicant would use experienced biologists and approved handling techniques that are unlikely to result in substantially elevated stress levels in translocated animals; (2) desert tortoises in the project footprint are currently part of a continuous

population with the resident populations of the recipient site and are likely to share similar pathogens and immunities; (3) some of the translocated desert tortoises would be moved a relatively short distance, which is likely to reduce post-translocation stress associated with long-distance movements; (4) density-dependent stresses are unlikely to occur; (5) any animal that has clinical signs of disease or tests ELISA-positive would not be translocated; and (6) monitoring of translocated individuals would be implemented to determine the prevalence of disease transmission.

Because ELISA testing can result in false-positive results (i.e., an animal may test positive even though it is not a carrier of the disease), the potential exists for removal of healthy individuals from the translocated population due to concern over disease. These individuals would not be released into the wild and would no longer contribute to the environmental baseline for the action area. Because the applicant would coordinate with the Service and perform follow-up testing of ELISA-positive individuals, the potential for removing false-positive individuals from the translocated population is low. Consequently, we conclude that few, if any, desert tortoises would be incorrectly removed from the population due to false positive results. Similarly, some of the animals that test positive may have survived past disease infections and are healthy. Though our understanding of disease ecology is not complete and removal of these individuals from the wild population could eliminate individuals with superior fitness and genetic adaptations for surviving disease from the gene pool, the low numbers of tortoises involved likely would not be large enough to affect population genetics in the wild.

Following the Service's translocation guidance (Service 2010a), translocated tortoises should be monitored for at least 5 years. Therefore, the tortoises translocated from the plant site, security fence line, or rerouted drainage channels off the plant site that would require blood draw for the purposes of translocation also would carry transmitters and be regularly monitored and handled annually for health assessments and blood draw for ELISA testing. Some potential exists that handling of desert tortoises for the purposes of conducting health assessments and monitoring may cause elevated levels of stress that may render these animals more susceptible to disease or dehydration from loss of fluids.

In conclusion, we do not anticipate that relocating tortoises out of harm's way, but less than 500 m (1,640 ft) from the point of capture, would result in death or injury because these individuals would be moved a relatively short distance and they would remain near or within their home range. Since relocated tortoises typically remain within their home range, we do not anticipate additional significant social or competitive impacts to resident tortoises in the area. Following release of tortoises translocated outside of their home range, a small number may die due to predation, exposure, disease, or competition. We anticipate most of this mortality is likely to occur in the first year after release, during the period that translocated animals are attempting to establish new home ranges. In addition, we anticipate that a small number of resident tortoises at the recipient site may die from natural causes due to predation, exposure, disease, or competition. However, we cannot determine if mortality rates in the resident or translocated populations would be above natural mortality levels for the recipient site. In addition, the potential impacts of capturing, handling, and moving tortoises for the purposes of relocation or

translocation would be minimized by the requirement for experienced biologists to handle all tortoises following Service-approved guidelines and relocate individuals out of harm's way or translocate individuals to the recipient site as will be outlined in the Relocation/Translocation Plan (BIO-9 and BIO-10). Lastly, as will be outlined in the final Relocation/Translocation Plan, translocated tortoises would be monitored, findings reported to the Service, and adaptive management strategies implemented, as needed.

### Habitat Loss

To offset permanent losses of tortoise habitat, the applicant would provide compensatory mitigation at a 1:1 ratio for impacts to approximately 708 ha (1,750 ac), and at a 5:1 ratio for impacts to approximately 10 ha (24 ac) of critical habitat. Quality of acquired habitat would be equivalent or better than that of the project footprint and benefit tortoise habitat connectivity and habitat linkages between tortoise critical habitat, known populations of tortoises, and/or other preserve lands in the Colorado Desert Recovery Unit in the BLM's NECO bioregional planning unit (BIO-12). These conservation lands would be conserved and managed in perpetuity for tortoises. Using available data on landownership and willing sellers, the Service has determined that a sufficient amount of privately owned desert tortoise habitat exists within the Colorado Desert Recovery Unit that would be available for acquisition. We are also aware of private lands that have been identified by private organizations as available for potential acquisition to offset impacts to desert tortoise habitat in the Eastern Colorado Desert Recovery Unit.

Native shrubs and annual plants used by tortoises for sheltering and feeding adjacent to the project footprint also may be adversely affected by introduced or previously naturalized invasive nonnative plants (also referred to as weeds) that respond positively to ground-disturbing activities. Project equipment may transport invasive nonnative plants into the project area where they may become established. Additionally, the potential introduction of noxious weeds may lead to increased wildfire risk (Brooks et al. 2003). However, potential degradation of habitat due to spread of invasive nonnative plants would be avoided and minimized by measures outlined in the Weed Management Plan designed to prevent the introduction of any new weeds and the spread of existing weeds as a result of project construction and O&M (BIO-14).

### *Indirect Effects*

Human activities may provide food in the form of trash and litter or water that attracts tortoise predators such as the common raven. Ravens capitalize on human encroachment and expand into areas where they were previously absent or in low abundance. Ravens habituate to human activities and are subsidized by the food and water, as well as roosting and nesting resources that are introduced or augmented by human encroachment. The nearby Blythe airport and other urban areas provide food, water features, and roosting/nesting substrates (buildings, signs, lamps, and utility poles) that otherwise would be unavailable. Small mammal, fox, coyote, rabbit, lizard, snake, and tortoise road kill along I-10 and other roads provide additional attractants and subsidies for opportunistic predators/scavengers. Road-killed wildlife would increase with

project construction and O&M traffic, further exacerbating the raven/predator attractions and increasing tortoise predation levels.

Facility infrastructure, such as power poles, fence lines, buildings, and other structures on the project site, may provide perching, roosting, and nesting opportunities for ravens. Natural predation rates may be altered or increased when natural habitats are disturbed or modified. Common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman 2002). Since ravens were scarce in the Mojave Desert prior to 1940, the existing level of raven predation on juvenile tortoises is considered an unnatural occurrence (BLM 1990). In addition to ravens, feral dogs have emerged as significant predators of tortoises in rural residential areas. Though feral dogs may range several miles into the desert and have been found digging up and killing tortoises (Service 1994a, Evans 2001), we are not aware of any reports of feral dogs in the project area.

To minimize the generation of food and water subsidies due to construction and O&M-related activities, all trash materials would be disposed of in self-closing containers and removed daily to prevent the attraction of tortoise predators to the project footprint, road-killed animals would be immediately removed from the project footprint, and the minimal amount of water needed would be applied to dirt roads and construction areas to avoid standing water, with a Biological Monitor patrolling those areas to ensure water does not puddle (BIO-8). Also, increases in raven abundance in the project area would be minimized by measures outlined in the Raven Monitoring, Management, and Control Plan (Raven Plan) which include a program to monitor raven presence in the project vicinity, would determine if raven numbers are increasing, and would implement raven control as needed based on monitoring (BIO-13).

In addition, desert tortoise behavior may be impacted by increased noise levels and the presence of full-time facility lighting during construction and operation of the facility over a 30-year period. While we do not have data demonstrating the effect of increased noise levels and the presence of artificial lighting to desert tortoise behavior, several measures proposed to minimize these potential impacts on other sensitive species (BIO-8) would also benefit tortoises.

Given that the proposed construction of the plant site would result in the loss of a 718 ha (1,774 ac) block of habitat, the project may also impact tortoises by disrupting movement of individuals to habitat north and south of the project site. For gene flow to occur reliably across the range, populations of tortoises need to be connected by occupied areas of habitat that contain sustainable numbers of tortoises. Desert tortoise distribution and population genetic studies provide evidence that individual tortoises breed with their neighbors, those tortoises breed with their neighbors on the other side, and so on. Removal of 718 ha (1,774 ac) of tortoise habitat from the area between I-10 and the Palen/McCoy Mountains Wilderness may further limit movement of tortoises, though habitat would remain west and east of the project boundaries to provide for continued connectivity after construction of the proposed project.

*Desert Tortoise Critical Habitat*

Approximately 10 ha (24 ac) of the 413,022 ha (1,020,600 ac), or less than 0.002 percent, of designated critical habitat in the Chuckwalla Critical Habitat Unit would be permanently and temporarily impacted by the construction of linear facilities off the plant site. The conservation measures proposed as part of the project, including the measure to offset habitat impacts with the acquisition of equivalent or better quality tortoise habitat in the Chuckwalla Critical Habitat Unit, would help maintain the role and function of critical habitat by avoiding and offsetting adverse effects to the primary constituent elements of critical habitat. In addition, the small impact of the proposed project to critical habitat would not affect population connectivity across the project area because habitat would remain west and east of the project boundaries to provide for connectivity after construction of the proposed project. In addition, as discussed in BIO-12, the REAT agencies would have approval authority over the parcels acquired through the NFWF account or by other means. Therefore, the BLM and Service would ensure that the small impacts to critical habitat would be offset through the purchase of suitable habitat within Chuckwalla Critical Habitat Unit to be consistent with BIO-12 and the conservation measures included as part of the proposed project description. As such, the proposed project would maintain the habitat base for supporting viable desert tortoise populations in critical habitat and prevent erosion of the environmental baseline on BLM lands in the highest value habitat areas that provide the primary focus for recovery efforts.

*Effect on Recovery*

Per section 2(b), the primary purposes of the Act are to provide a means whereby the ecosystems upon which listed species depend may be conserved, and to provide a program for the recovery of listed species. Per section 2(c), Congress established a policy requiring all Federal agencies to use their authorities in seeking to recover listed species in furtherance of the purposes of the Act. Consistent with these purposes and Congressional policy, sections 3(5), 4(f), 7(a)(1), and the implementing regulations (50 *CFR* §402.02) to section 7(a)(2), and related preamble at 51 *FR* 19926 through 51 *FR* 19957, generally require Federal agencies to further the survival and recovery of listed species in the use of their authorities. Pursuant to these mandates, our analysis below assesses (1) whether the proposed action adequately offsets its adverse effects to the environmental baseline to the desert tortoise, and (2) the extent to which the proposed action would cause “significant impairment of recovery efforts” or adversely affect the “species’ chances for survival to the point that recovery is not attainable” (51 *FR* 19934).

The applicant would implement numerous measures to avoid, minimize, reduce, and offset the adverse effects to the relatively few tortoises in the project footprint. Overall, we expect that five or fewer subadult and adult and three or fewer juvenile desert tortoises would be captured, injured, or killed during construction of the solar facility, and that a relatively small but unquantifiable number of eggs may be moved or destroyed during construction. Few tortoises would be killed or injured during O&M of the facility. We expect that most subadult and adult tortoises encountered during work activities would be either moved short distances out of harm’s way or translocated. Because the BLM and applicant would implement a variety of measures to

reduce stress to these animals, we do not anticipate that injury or mortality would result from the handling and relocation of these animals.

We do not anticipate that loss of habitat in the project footprint would substantially reduce the ability of the tortoise to survive and recover in the wild because the recovery plan (Service 1994a) and final rule for designation of critical habitat for the species (Service 1994b) primarily focuses long-term conservation priorities in higher value habitat areas. The proposed acquisition of 708 ha (1,750 ac) of tortoise habitat, including 48 ha (120 ac) in the Chuckwalla Critical Habitat Unit, would benefit tortoise habitat connectivity and habitat linkages between tortoise critical habitat, known populations of tortoises, and/or other preserve lands in the Colorado Desert Recovery Unit in the BLM's NECO bioregional planning unit.

Based on the results of studies discussed above, most of the subadult and adult tortoises moved from the project footprint likely would continue to survive and reproduce at the location to which they are moved (i.e., in adjacent habitat or the recipient site). Consequently, we anticipate that the proposed project would not appreciably diminish the reproductive capacity of the species, particularly in light of the relatively few tortoises that would be affected.

The overall distribution of the desert tortoise would be minimally reduced due to long-term disturbance associated with the proposed action because the proposed project would result in loss of a small percentage of the habitat in the Eastern Colorado Desert Recovery Unit [which includes the 413,022-ha (1,020,600-ac) Chuckwalla Critical Habitat Unit, a majority of the approximately 404,686-ha (1,000,000-ac) Joshua Tree National Park, and additional lands]. This percentage does not constitute a substantial portion of the recovery unit. Given the location of the proposed project in an area near the edge of the tortoise's range, we do not anticipate that the amount of habitat to be lost because of the proposed project would reduce the distribution of the tortoise to an appreciable degree.

## CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, private, or certain tribal actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any future State, local, private, or certain tribal actions that are reasonably certain to occur in the action area.

## CONCLUSION

After reviewing the current status, environmental baseline for the action area, effects of the proposed action, and cumulative effects of the desert tortoise, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the desert tortoise or destroy or adversely modify designated critical habitat. We base this decision on the following:

1. The applicant will implement numerous measures to ensure that most tortoises are moved out of the project footprint and injury and death of tortoises is minimized (i.e., clearance surveys, exclusion fencing, relocation, translocation, and qualified tortoise biologists).
2. The applicant will implement measures to reduce the potential for increased predation by common ravens, both in the vicinity of the project footprint and regionally, and to reduce the spread of invasive nonnative plants in the project area.
3. Current information from permanent study plots and line distance sampling does not document a statistical trend in adult tortoise densities in the Eastern Colorado Desert Recovery Unit. Nonetheless, given the small number of tortoises potentially affected by the proposed project, we have no information to indicate that development of the proposed project would appreciably reduce the tortoise population levels in this recovery unit.
4. Few, if any, tortoises are likely to be injured and killed as a result of relocation or translocation.
5. Though the proposed project would reduce the amount of available tortoise habitat and thereby result in a loss of habitat connectivity, sufficient habitat would remain to the west and east of the proposed project to provide connectivity of tortoises in the long term. Relocation of some tortoises into habitat adjacent to the project area, and translocation of some tortoises to a recipient site will increase tortoise numbers in those areas. Successful translocation would minimize these effects by allowing those tortoises to remain in the population and contribute towards recovery of the species.
6. Compensation requirements through the BLM, CDFG, and CEC will result in an increase in the quantity and quality of habitat managed for the conservation of the tortoise.
7. With implementation of the conservation measures, the impacts of the proposed project are expected to be effectively minimized and offset, and are not likely to diminish appreciably the conservation role and function of designated critical habitat for desert tortoise in the project area or the species' ranges.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act, and Federal regulation pursuant to section 4(d) of the Act, prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to,



and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below for desert tortoises are non-discretionary and must be undertaken by the BLM so that they become binding conditions of any grant or permit issued to the applicant/permittee, as appropriate, for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant/permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the BLM must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

#### AMOUNT AND EXTENT OF TAKE

We anticipate that the number of desert tortoises that may be taken would be low due to the small number of individuals estimated to occur within the project footprint and the anticipated effectiveness of conservation measures described as part of the proposed action. However, quantifying the precise number of individuals that may be incidentally taken is not possible because this species is cryptically colored to avoid predation, and spends the majority of its life inhabiting burrows to avoid environmental extremes or predation, making the observation or detection of death or injury difficult. In addition, population numbers fluctuate in response to weather patterns and other biotic and abiotic factors, and population levels and the distribution of individual animals have changed since the species surveys were completed and are anticipated to continue changing over the 30-year life of the project. The number of tortoise eggs and juveniles is even more difficult to quantify because of small size, in addition to the other reasons discussed above. As a result, finding dead or injured individuals within the project area is difficult as individuals may be crushed or buried underground in burrows that were not found or inspected, and otherwise hard to recognize/detect for the reasons discussed above. Because eggs and juveniles are almost never found during clearance surveys, we assume virtually all these early life forms will be killed or injured by construction and O&M activities within the project footprint.

While we cannot provide the precise number of desert tortoises that may be taken, we have estimated the number of subadult and adult tortoises (tortoises with a midline carapace length greater than 160 mm) in the project footprint based on the best available information, and based on this estimate have established take thresholds that, if exceeded, will trigger reinitiation of consultation.

Take of desert tortoises is anticipated and exempted as follows:

- The disturbance of up to 718 ha (1,774 ac) of habitat from construction and O&M-related activities may result in accidental death or injury of tortoise eggs, juveniles, subadults or adults from crushing, trampling, or burial. If the project impacts more than this acreage of tortoise habitat, the take threshold will be exceeded.
- As discussed in the “Environmental Baseline” section above, we estimate that up to five subadult and adult tortoises and up to three juvenile, and a relatively small but unquantifiable number of eggs could occur in the project footprint. While we cannot quantify the precise numbers of tortoises that may be killed or injured as a result of construction or O&M activities for the reasons discussed above, we anticipate the number of subadult and adult tortoises that may be killed or injured will be small because no tortoises were found during surveys, which indicates an apparently small population in the project footprint, and because most tortoises will be found during pre-project clearance surveys. Therefore, using our best professional judgment and in light of best available information, we anticipate that construction of the proposed project will result in the incidental take of two individuals, and that O&M activities will result in incidental take of two individuals per year. However, based on the difficulty of detecting individual tortoises, we anticipate each report of incidental taking could represent the actual death or injury of two tortoises. As a result, we anticipate no more than one tortoise per year may be reported dead or injured from construction and no more than one tortoise per year may be reported dead or injured from O&M activities. Thus, if more than one tortoise per year is found injured or dead during construction activities, and more than one tortoise per year is found injured or dead during O&M activities, the take threshold will be exceeded.
- Take, in the form of capture or collection, of up to five subadult and adult tortoises, up to three juveniles, and a relatively small but unquantifiable number of eggs for the purposes of relocation or translocation from within the project construction and O&M disturbance area. However, because the capture or collection, relocation/translocation, and release will be conducted by a Service-approved Biologist, we do not expect these activities to result in direct injury or death of any relocated/translocated tortoises. Therefore, we do not want to limit the ability of the Service-approved Biologist to avoid and minimize the direct injury or death of tortoises by relocating/translocating tortoises found during preconstruction clearance surveys. Thus, all take in the form of trapping, capture, or collection for the purposes of relocation is exempted for any eggs, juveniles, or subadult or adult tortoises found during clearance surveys, monitoring activities, or other incidental observations, subject to the reasonable and prudent measures and terms and conditions below. If any tortoises are directly injured or killed during relocation or translocation, the take threshold will be exceeded.
- Take, in the form of capture or collection, of up to five subadult and adult tortoises for the purposes of monitoring transmittered tortoises. Although transmittered tortoises may

be captured multiple times over the course of the post-translocation monitoring effort, we do not anticipate injury or mortality of these individuals due to post-translocation monitoring. However, if any tortoises are directly injured or killed during monitoring activities, the take threshold will be exceeded.

- Take, in the form of capture or collection, of up to 20 subadult and adult tortoises (up to five from the project footprint, up to ten from the Genesis recipient site, and up to five from the Upper McCoy Wash recipient site) for the purposes of blood draw for ELISA testing to assess disease prevalence. Although such an invasive procedure presents some likelihood that individuals could be injured or killed, we do not anticipate that blood draw will result in the death or injury of any individuals because blood draw will be conducted by Service-approved Biologists, following Service-approved methods. If any tortoises are directly injured or killed as a result of blood draw, the take threshold will be exceeded.

## IMPACT OF THE INCIDENTAL TAKING OF THE SPECIES

In the accompanying biological opinion, the Service determined that these levels of anticipated take are not likely to result in jeopardy or adversely affect the recovery of the tortoise.

## REASONABLE AND PRUDENT MEASURES

The BLM and applicant are implementing conservation measures for this project as part of the proposed action to minimize the taking of desert tortoises. The Service's evaluation in the biological opinion includes consideration of the conservation measures developed by the BLM and applicant to reduce the adverse effects of the proposed project on this species. Any subsequent changes in the conservation measures proposed by BLM or applicant or in the conditions under which these activities currently occur may constitute a modification of the proposed action and may warrant reinitiation of formal consultation, as specified at 50 *Code of Federal Regulations* § 402.16. These reasonable and prudent measures are intended to supplement the protective measures that were proposed by BLM and applicant as part of the proposed action, and are necessary and appropriate to minimize the impact of the taking on desert tortoises.

- The BLM and applicant shall monitor and report the level of incidental take of desert tortoises to the CFWO throughout the life of the project and report on the effectiveness of the project minimization measures to reduce the impact of incidental take of tortoises.

## TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the BLM and applicant, and all agents/contractors, must comply with the following terms and conditions, which implement the

reasonable and prudent measures described above, and are intended to minimize the impact of the incidental taking. These terms and conditions are non-discretionary.

The following term and condition implements the reasonable and prudent measure above.

1. The applicant shall prepare and provide to the Service and BLM an annual report by December 31 of each year of the project. The annual report shall document but not be limited to, the following:
  - Compliance with project-specifications and conservation measures outlined in this biological opinion, including BIO-1 thru BIO-14, and BIO-29 outlined in the CEC's Commission Decision on the GSEP project (CEC 2010b), as they relate specifically to desert tortoises.
  - Any activities determined by the Designated Biologist or Biological Monitors to be out of compliance with project-specifications and conservation measures outlined in this biological opinion and the corrective measures implemented to bring the project back into compliance.
  - The total amount and location of desert tortoise habitat disturbed by construction and O&M activities during the reporting year.
  - The number and location of desert tortoises killed or injured during project construction or O&M activities during the reporting year and a description of the circumstances leading to the death or injury of individuals of the species.
  - Activities conducted under the Desert Tortoise Relocation/Translocation Plan (BIO-10) during the reporting year, including but not limited to, the number and location of desert tortoise eggs, juveniles, subadults, or adults located during project activities and relocated or translocated during preconstruction, construction, and/or O&M activities during the reporting year and a detailed description of the relocation/translocation activities, and a detailed description of monitoring activities conducted at the recipient and control sites during the reporting year.

If more than five adult desert tortoises, or any eggs, juveniles or subadults are found within the project footprint, the Designated Biologist shall immediately report the observation to the CFWO, prior to any relocation/translocation activities. The CFWO will review the information to determine its consistency with the effects analysis above and if relocation/translocation of additional desert tortoises would benefit their survival and be consistent with our assumptions in the biological opinion, and if reinitiation of consultation is warranted.

- Activities conducted under the Raven Management Plan (BIO-13) during the reporting year, including but not limited to, the results of raven nest monitoring and removal of raven nests and offending ravens.
- Activities conducted under the Weed Management Plan (BIO-14), including but not limited to, invasive plant species control activities conducted during construction or O&M activities in the project disturbance area during the reporting year and the status of control activities conducted the previous year.

#### *Disposition of Sick, Injured, or Dead Specimens*

The CFWO is to be notified immediately at (760) 431-9440 if any desert tortoises are found sick, injured, or dead in the action area. Immediate notification means verbal (if possible) and written notice within 1 workday, and must include the date, time, and location of the carcass, and any other pertinent information. Care must be taken in handling sick or injured individuals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible state.

The CFWO should also be notified immediately at (760) 431-9440 if any endangered or threatened species not addressed in this biological opinion is found dead or injured in the project footprint during the life of the project. The same reporting requirements also shall pertain to any healthy individual(s) of any threatened or endangered species found in the action area and handled to remove the animal to a more secure location.

#### *Reporting Requirements*

Please refer to the “Terms and Conditions” section above for details on reporting procedures.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the BLM work with the applicant and Service to determine if the translocated desert tortoises associated with the translocated populations can be used to answer additional research questions related to translocation or desert tortoise biology.
2. We recommend that the BLM amend the California Desert Conservation Area Plan to prohibit additional renewable energy development (e.g., solar energy facilities, wind development) within the unused portion of the 3,804-ha (9,400-ac) ROW granted for

construction and O&M of the GSEP project, particularly within the proposed Genesis recipient site. We offer this recommendation because this area is likely to be used as a recipient site for translocated desert tortoises from the GSEP project. Additionally, we are aware of one other ROW application filed with the BLM for development of large-scale solar facilities directly west of the GSEP project. Given this proposed project, the potential exists that desert tortoise habitat adjacent to the GSEP may be disturbed and fragmented to the extent that desert tortoises and other wildlife populations in the area may be severely compromised.

3. We recommend that the BLM amend the California Desert Conservation Area Plan to prohibit additional renewable energy development (e.g., solar energy facilities, wind development) within the upper bajadas (mapped as “dissected fans” on the NECO Map 3-4, Landforms) in the mountains of northeastern Riverside County. We offer this recommendation because this action would protect the higher quality tortoise habitat in this area.

### **REINITIATION NOTICE**

This concludes formal consultation on the proposed project for the desert tortoise. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

If you have any questions regarding this document, please contact Tannika Engelhard at the Carlsbad Fish and Wildlife Office at (760) 431-9440, extension 202.

#### **Attachments:**

Figure 1. Genesis Solar Energy Project Location

Figure 2. Genesis Solar Energy Project Site Plan

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# Genesis Solar, LLC

## GENESIS SOLAR ENERGY PROJECT RIVERSIDE COUNTY, CALIFORNIA



- Blythe Energy Project Transmission Line
- Blythe Energy Project Transmission Line Structure
- Transmission Interconnect
- Transmission Interconnect on Existing Poles
- Gas Line
- Access Road
- New Distribution Line/Redundant Communication Line
- Redundant Communication Line in Existing ROW
- Project Requested ROW
- Plant Site
- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Area of Critical Environmental Concern
- BLM Wilderness
- County Assessor Parcel
- Township/Range
- Section

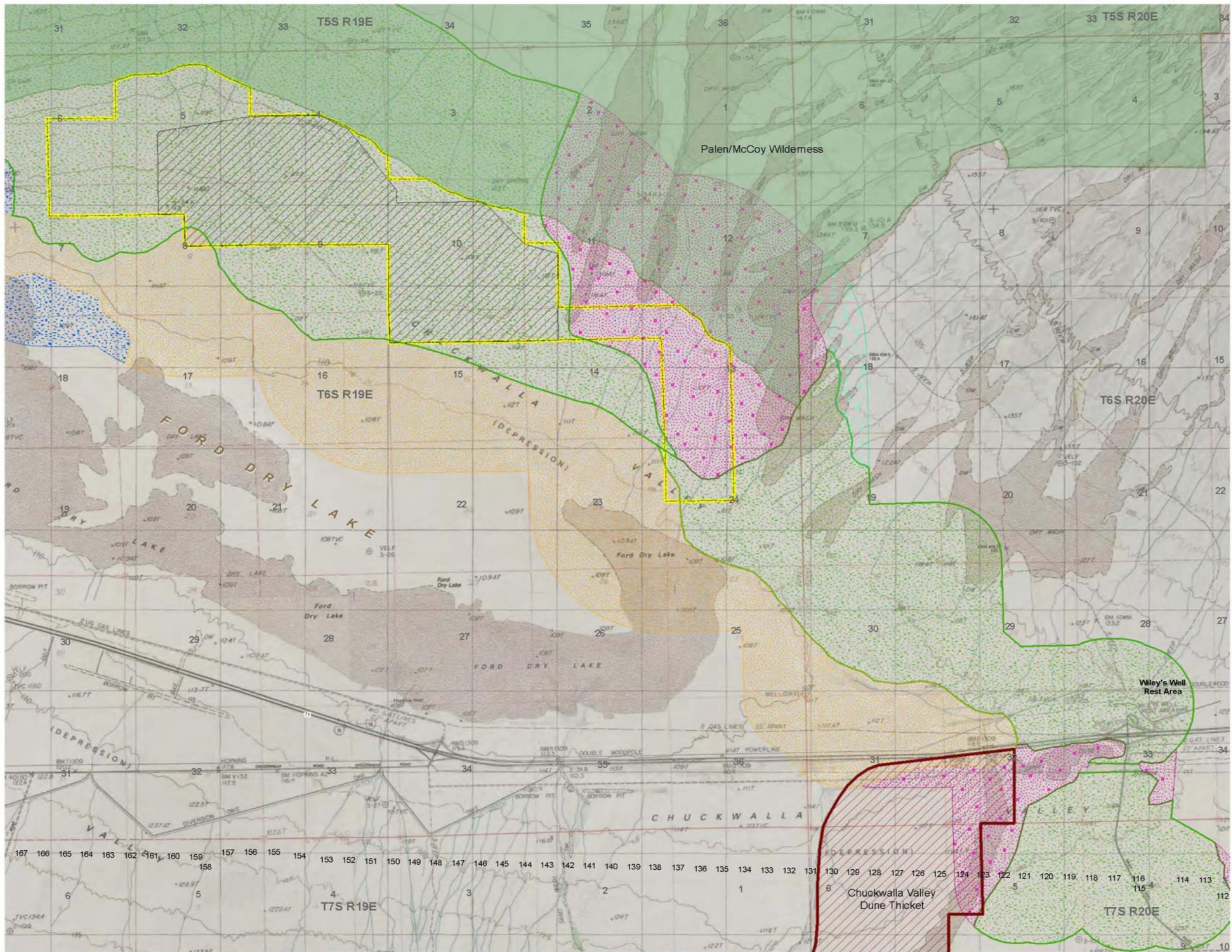
0 0.5 1 1.5 2  
Miles

Notes:  
(a) UTM Zone 11, NAD 1983 Projection.  
(b) Source data: ESRI, TTEC, USDA, Riverside County, A. Karl & Assoc.

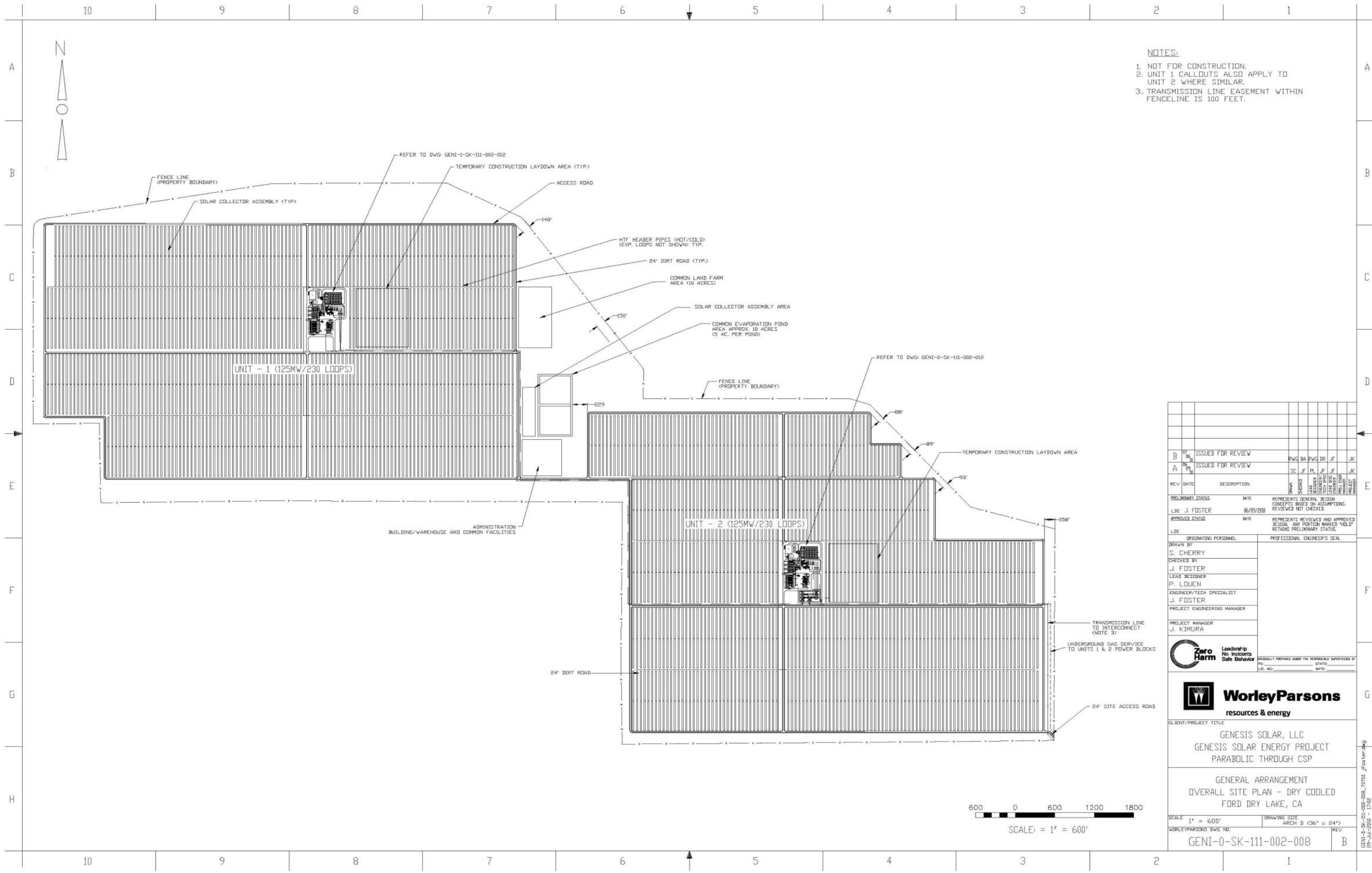
## UTILITIES WITHIN LINEAR CORRIDOR



Last Saved: Monday, August 9, 2010 Analyst: S. Marrs  
File: P:\projects\_2005\fp\maps\Genesis\_EA\Genesis-Complete\_Project.mxd







- NOTES:
1. NOT FOR CONSTRUCTION.
  2. UNIT 1 CALLOUTS ALSO APPLY TO UNIT 2 WHERE SIMILAR.
  3. TRANSMISSION LINE EASEMENT WITHIN FENCELINE IS 100 FEET.

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